

① Simplify

$$\textcircled{a} \frac{x^2 x^3}{x^7} = \frac{\cancel{x} \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{x}}{\cancel{x} \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{x}} = \frac{1}{x^2}$$

$$\frac{x^5}{x^7} = x^{5-7} = x^{-2} = \boxed{\frac{1}{x^2}}$$

$$\textcircled{b} \frac{(2xy^2)^3}{xy^2} = \frac{2^3 x^3 y^6}{xy^2}$$

$$\boxed{= 8x^2 y^4}$$

$$\textcircled{c} \sqrt{12x^3y^6}$$

$$\sqrt{12} = \sqrt{4} \cdot \sqrt{3}$$

$$= \underline{\underline{2\sqrt{3}}}$$

$$\sqrt{x^3} = \sqrt{\underline{\underline{x \cdot x \cdot x}}}$$

$$= \underline{\underline{x\sqrt{x}}}$$

$$\sqrt[3]{y^6} = \underline{\underline{y^3}}$$

$$\boxed{2xy^3\sqrt{3x}}$$

$\sqrt{\quad}$	$\sqrt{\quad}$
1	1
4	8
9	27
16	64
25	125
36	216
49	343
64	512
81	729
100	1000

$$\textcircled{d} \sqrt[3]{81x^4y^2}$$

$$\sqrt[3]{81} = \sqrt[3]{27} \cdot \sqrt[3]{3}$$

$$\downarrow$$

$$3 \sqrt[3]{3}$$

$$\sqrt[3]{x^4 y^2}$$

$$x\sqrt{x y^2}$$

$$\boxed{= 3x \sqrt[3]{3xy^2}}$$

$$\sqrt[3]{-250x^6y^5}$$

$$-5 \cdot -5 \cdot -5 = -125$$

$$\sqrt[3]{-250} = \sqrt[3]{-125 \cdot 2}$$

$$\underline{\underline{-5}} \sqrt[3]{2}$$

$$\sqrt[3]{x^6y^5}$$

$$\underline{\underline{x^2y}} \sqrt[3]{y^2}$$

$$= -5x^2y \sqrt[3]{2y^2}$$

# Rationalizing - simplify roots

$$\frac{4}{8} = \frac{1}{2}$$

$$\frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$\frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

$$\frac{2}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$$

$$\frac{1}{\sqrt[3]{2}} \cdot \frac{\sqrt[3]{2}}{\sqrt[3]{2}} \cdot \frac{\sqrt[3]{2}}{\sqrt[3]{2}} = \frac{\sqrt[3]{4}}{2}$$

$$\frac{5}{\sqrt[3]{2}} \cdot \frac{\sqrt[3]{2}}{\sqrt[3]{2}} \cdot \frac{\sqrt[3]{2}}{\sqrt[3]{2}} = \frac{5\sqrt[3]{4}}{2}$$

Sect. 7.2  
#23-30